

U.S. Patent Application Serial No. 10/516,941

Amendment filed June 25, 2009

Reply to OA dated February 27, 2009

REMARKS

Claims 1-16, 18 and 19 are pending in this application, with claims 9-15 withdrawn from consideration. Claims 3-5 are canceled without prejudice or disclaimer, and claim 1 is amended herein. Upon entry of this amendment, claims 1, 2, 6-16, 18 and 19 will be pending, with claims 9-15 withdrawn from consideration. Entry of this amendment and reconsideration of the rejections are respectfully requested.

No new matter has been introduced by this Amendment. Support for the amendment to claim 1 may be found in canceled claims 3-5, and in the specification at page 9, lines 13-17, and page 18, lines 6-9.

Claims 1-8, 16, 18 and 19 are rejected under 35 U.S.C. §112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. (Office action p. 2)

The Examiner states that it is unclear how the "canister case" differs from the canister. The Examiner asks, "Is the carbon really put in a canister, which is then put in something else."

This rejection is respectfully traversed. The term "canister" occurs in the preamble of the claim, and clearly refers to the complete product of claim 1. The "canister case" is clearly the unfilled canister. The separate term "canister case" is used to distinguish it from the filled canister.

This usage is completely consistent with two dictionary definitions of canister: "1. a small box or can for holding a dry product." "3. a perforated metal box for gas masks with material to

absorb, filter or detoxify airborne poisons or irritants." (*Webster's Ninth New Collegiate Dictionary*, Merriam-Webster (1983)). That is, a canister can be the empty can or a filled can.

The present wording of "canister case" for the empty canister avoids confusion between the two possible meanings of "canister." Reconsideration of the rejection is requested.

Claims 1-8, 16, 18 and 19 are rejected under 35 U.S.C. §103(a) as being unpatentable over JP 2002-045385 taken with JP 09-183605. (Office action p. 2)

Reconsideration of the rejections is respectfully requested in view of the amendment to claim 1. Claim 1 has been amended to include limitations from canceled claims 3-5 and from the specification at page 9, lines 13-17, and page 18, lines 6-9, and notes the following points about the added limitations:

"the average particle diameter of the heat-storage material is about 1/1000 to about 1/10 of that of the adsorbent"

A heat-storage material having an average particle diameter smaller than the particle diameter of the adsorbent can achieve a large contact area with the adsorbent. This facilitates the transference of adsorption/desorption heat, enhancing the ability of the canister.

"the average particle diameter of the heat-storage material is about 0.1 to about 500 μm ."

A heat-storage material having a smaller average particle diameter achieves better contact efficiency with the adsorbent. However, when the heat-storage material has an average particle diameter of less than 0.1 μm , the film thickness will be thinner. This renders the phase-change

material included in the heat-storage material permeable, causing poor durability of the adsorbent. Conversely, the average particle diameter of more than 500 μm will cause breakage of the heat-storage material during processes such as molding.

“the diameter of the micro pore is about 10 Å to about 50 Å,”

When the diameter of the micro pore with respect to the adsorbent is less than 10Å, compounds having a high boiling point will remain inside the micro pores due to the repetitive operations of adsorption and desorption, resulting in deterioration of adsorbent performance. Conversely, when the diameter of the micro pore is more than 50Å, the adsorption ability of the adsorbent will be lowered.

“the content of the heat-storage material is about 10 to about 100 parts by weight based on 100 parts by weight of the adsorbent”

When the content is less than 10 parts by weight, the generated adsorption/desorption heat cannot be sufficiently removed, resulting in a limited improvement in performance. Conversely, when the content is more than 100 parts by weight, the adsorption/desorption heat can be sufficiently removed; however, the amount of the adsorbent will be decreased, resulting in deteriorated performance.

Non-obviousness over JP '385 taken with JP '605

The invention disclosed in JP '385 is for use as a heat insulating material, such as a cold reserving material, Cairo (a body warmer), a hot water bottle, an anka (a foot warmer), etc., uses which do not suggest the canister form of the present invention.

JP '385 discloses in paragraph [0010] that the amorphous carbon compound (activated carbon) is used in an amount of 1 to 100 parts based on 100 parts of microcapsule. In the Examples in the reference, the activated carbon was, however, actually used in an amount of 60 parts based on 100 parts of microcapsule (Example 1), and 10 parts based on 100 parts of microcapsule (Example 2). In other words, the amorphous carbon compound (activated carbon) was mixed in a smaller amount than the amount of the microcapsule.

This ratio is consistent with the general disclosure of JP '385 for the usage of the invention. The invention disclosed in JP '385 is for use as a heat insulating material, and therefore the microcapsule, which is a thermal storage medium, must be used in a sufficient amount. The amorphous carbon compound (activated carbon) is mixed for the purpose of removing unpleasant odors or chemical smells emitted from raw materials that are essential to carry out a microencapsulation process.

In comparison, the object of the present invention is to efficiently adsorb and desorb fuel vapor on the surface of the adsorbent. In order to achieve this object, the adsorbent, with which the adsorption and desorption are carried out, must be used in a greater amount.

JP '605 contains a disclosure with respect to a canister. However, the canister disclosed in JP '605 is similar to that of the present invention only in the respect that the degradation of canister

performance is inhibited. The invention of JP '605 does suggest controlling the temperature of the adsorbent through the use of a heat-storage material, which is the object of the present invention. Additionally, JP '605 nowhere discloses a microencapsulated phase-change material, which is a heat-storage material. Therefore, JP '605 does not disclose setting the quantitative proportion of the heat-storage material relative to the adsorbent, and it does not disclose setting the proportion of the particle diameter of the heat-storage material relative to the adsorbent.

Therefore, there is no suggestion in the references for the combination of limitations of amended claim 1, and the claims, as amended, are not obvious over JP '385 and JP '605, taken separately or in combination.

Claims 1-8, 16, 18 and 19 are rejected under 35 U.S.C. §103(a) as being unpatentable over Steelman et al. 5,506,293 taken with Klett 6,673,328 and Klett 6,780,505. (Office action p. 2)

Reconsideration of the rejection is respectfully requested in view of the amendments to the claims.

Applicant has previously argued with regard to the combination of Steelman '293 and Klett '328 that there is no disclosure of an adsorbent in Steelman, since Steelman is directed to an isotropic resin composition and merely discloses a conductive or dielectric resin composition for use in structural adhesives. In addition, the carbon foam of Klett '328 is incapable of significantly adsorbing and desorbing fuel vapor. Therefore, the combination of Steelman '293 and Klett '328 cannot provide the adsorbent recited in claim 1.

In arguing against the present rejection, Applicant again notes that Steelman nowhere discloses an adsorbent. Further, the usage of the invention of Steelman is different from that of the present invention. Additionally, the phase-change material of Klett '328 is not microencapsulated, while claim 1 requires that it be microencapsulated. When carbon foam is filled with the phase-change material, the phase-change material is adsorbed into the pores of the foam, leading to a reduction in the adsorption ability.

In addition, Klett '328 discloses that the pore size of carbon foam is in the range of 90-200 μm , which is clearly different from the range of the diameter of the micro pore (about 3.0 - 50Å) in amended claim 1. Furthermore, a material having the same pore size range as that of the carbon foam disclosed in Klett '328 is not applicable as an adsorbent for canisters, for the reasons stated above.

Moreover, in the Examples in Klett '328 and Klett '505, when the phase-change material, which is a heat storage material, the amount of the phase-change material was 921 g, while the amount of the carbon fiber was 614 g, i.e., the phase-change material was used in a greater amount than the heat storage material (see Example XVII of Klett '328 and Example 1 of Klett '505). If a canister is produced applying the above proportion of the phase-change material to the heat storage material, the amount of adsorbent would be decreased, causing a reduction in performance, as explained above; therefore, an improvement in performance cannot be made.

The Examiner asserts that Klett '505 mentions canisters. However, Klett '505 nowhere discloses or suggests adsorbing and desorbing fuel vapor, while claim 1 requires an adsorbent.

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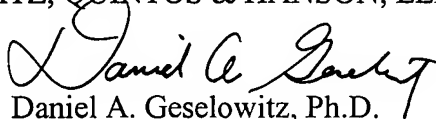
Clearly, Klett '505 does not disclose or suggest a canister comprising an adsorbent, as required by claim 1.

The claims, as amended, are therefore not obvious over Steelman et al. 5,506,293, Klett 6,673,328 and Klett 6,780,505, taken separately or in combination.

If, for any reason, it is felt that this application is not now in condition for allowance, the Examiner is requested to contact the applicant's undersigned agent at the telephone number indicated below to arrange for an interview to expedite the disposition of this case.

In the event that this paper is not timely filed, the applicant respectfully petitions for an appropriate extension of time. Please charge any fees for such an extension of time and any other fees which may be due with respect to this paper, to Deposit Account No. 01-2340.

Respectfully submitted,
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PATENT & TRADEMARK OFFICE

Enclosure: Petition for Extension of Time
Request for Continued Examination

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